

HEALTH SCIENCE EDUCATION

Allied Health Pathway	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
*Health and Wellness		x	x	x	½ --1
*Medical Science		x	x	x	1-2
Advanced HCS/Practicum				x	1--3
Advanced Nursing Assistant				x	1
Allied Health Core Skills			x	x	1—2
Body Structure and Function			x	x	1
Emergency Procedures		x	x	x	½ --1
Health Science Independent Study				x	1-3
Health and Wellness – Growth and Development		x	x	x	½--1
Leadership Development	x	x	x	x	½ - 1
Medicaid Nurse Aide			x	x	1-2
Medical Math		x	x	x	½ --1
Medical Microbiology			x	x	½ - 1
Medical Terminology		x	x	x	½ --1
Pharmacology			x	x	½--1
Principles of Health Science	x	x	x	x	1
Principles of Teaching				x	1
Special Topics				X	1-3

Pre-Nursing Pathway	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Principles of Health Science	X	X			1
Medical Terminology		X			½-1
Emergency Procedures		X	X		½-1
Medicaid Nurse Aide			X	X	2
Advanced Nursing Assistant				X	2
Advanced HCS/Practicum				X	1-2

Biomedical Science Pathway	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Principles of Biomedical Science	x				1
Human Body Systems		x			1
Medical Interventions			X		1
Medical Innovations				X	1

Health Informatics Pathway	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Principles of Health Science	X	X			1
Medical Terminology		X	X		½-1
Principles of Health Informatics		X	X		1
Practicum				X	1-2

Sports Medicine	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Building					

Pre-Med	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Building					

Dental Assisting	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Building					

Pharmacy Technician – Pre-Pharmacy	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Principles of Health Science	X	X			1
Medical Terminology		X	X		½-1
Elective					1
PassAssured - Practicum				X	1-3

Crime Scene Investigator	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	
Building					

	Recommended Grade Level				Recommended Course Credit
	9	10	11	12	

**Interdisciplinary Courses. May be taught for required graduation requirement in a Core Content area. These courses include correlations to the Program of Studies, guiding questions, sample activities and extensions for diverse learners. CTE teachers must meet NCLB criteria for granting academic credit. Bolded courses are under development. Content is not included.*

Overview of Health Science Program

The Health Science Program provides the secondary student with orientation, exploration, and preparation into the health care industry. Courses are sequenced to provide continuous student progress toward achievement of a career major goal in either an Allied Health or Pre-Nursing major. The integration of literacy, numeracy, science, employability and technical knowledge is a vital component of each course offering.

This program assists the student in developing essential cognitive, affective, and psychomotor skills and the flexibility to design an individual course of study focused on specific learning goals. The program is designed for students who desire entry-level training and/or plan to enroll in a post secondary program in one of many occupational areas in the health field. After obtaining a satisfactory performance level in the health care core competencies, the student may obtain work experience in a health-related facility.

Why a Health Science Program?

Career Technical program offerings should be based on the needs of the community and state—the one occupation needed in all communities is health care. Students should have the opportunity to obtain training in fields of study that offer the probability of employment once that training is completed. Currently, Kentucky joins a nationwide shortage of health care workers. At a time when many industries are downsizing, the health care industry is one of the largest industries in the country, with about 11.3 million jobs. Over 14% of all wage and salary jobs created between 1998 and 2008 will be in health services. Twelve out of 30 occupations projected to grow the fastest are concentrated in health services.

Health care professionals work in a variety of settings such as clinics, laboratories, hospitals, schools and sometimes, even outdoors! Whether the student wants to be a forensic pathologist, a nurse, a cardiovascular technician or physical therapist, there are lots of challenging careers in health care that pay well. Combining medical technology and the human touch, the health services industry administers care around the clock, responding to the needs of millions of people across the lifespan. More than 460,000 establishments make up the health services industry. Two-thirds of all private health service establishments are offices of physicians or dentists. Although hospitals comprise less than 2 percent of all private health service establishments, they employ nearly 40 percent of all workers.

The number of health care specializations are fueling the overall growth of the industry because of: an aging population; new forms of information technology; the need for multi-skilled workers; the move toward preventative and primary care; the increase in outpatient surgery; more preventative care in the workplace; a decrease in the number of health care workers in rural and inner city areas; and the exodus of many “mature” workers into other professions or retirement.

Program Requirements

State/federal regulations establish a maximum student/teacher ratio for the Health Science program with clinical affiliations and shall not exceed fifteen (15) to one (1) for Medicaid Nurse Aide training. Other student/teacher ratios should be based on current state guidelines regulating class size. It is recommended that class sizes be based on the availability of space and equipment and the nature of the course.

The program shall meet the criteria established by state and national approval/accrediting agencies that certify and/or register the graduates of the program. In a Health Science program, the teacher on record shall be a licensed (active) health care professional in the Commonwealth of Kentucky and meet requirements for teaching in a Career Technical Program area. A teachers of the Medicaid Nurse Aide course must be a Registered Nurse and meet the guidelines as established by the Kentucky Medicaid Program and meet the requirements for teaching a Career Technical program area. A recommended list of equipment and supplies and facility guidelines for the program is available.

Professional and Student Organization

The Health Occupations Students of America (HOSA) organization is an integral part of the Health Science program. Students who are enrolled in or who have completed a course from the Health Science curriculum are eligible to become members. Leadership training, community service and the opportunity to apply technical and academic competencies are available to all members. Local chapters affiliate with the state and national organization and students may be eligible to attend state and/or national conventions or conferences. More information about HOSA and its' resources is available at www.hosa.org

Teachers in the Health Science Education program are expected to participate in the appropriate professional organization to keep skills and knowledge current. Membership in the Kentucky Association of Career and Technical Education (KACTE) organization provides many benefits and a link to other professional educators in CTE. Membership and benefit information can be found at www.kacteonline.org

Work-Based Learning

Work-based learning within the Health Science program may include shadowing, clinical experience, career major practicum, and/or cooperative education. These experiences should be connected to the student's career major in either an Allied Health or Pre-Nursing area. Cooperative Education consists of in-school instruction combined with on-the-job work experience. Specific guidelines are outlined in 705 KAR 4:041. Information on other types of work-based learning is described in detail in the document Work-Based Learning Guide 2000, which is available on the KDE web page at : <http://www.kde.state.ky.us/careerandtechnicaleducation/resourcesandpublications>.

Specific guidelines for work-based learning relating to the Health Science program include:

- A health science teacher who is licensed in Kentucky as a Registered Nurse must provide clinical supervision for Medicaid Nurse Aide training.
- All Health Science students must be covered by a professional liability insurance plan as required by the affiliating agency;
- All Health Science students must have completed or are currently enrolled in the Principles of Health Science, Emergency Procedures, and Health Care Core Skills or Medicaid Nurse Aide courses prior to a cooperative experience;
- The school shall use the approved standard agreement with each cooperating agency specifying responsibilities and authority of each party to the agreement;
- A "Statement of Understanding" defining student responsibilities shall be signed by student and parent or guardian prior to assignment in a clinical area, practicum, or cooperative experience.

Program Review/Use of Data

All secondary Health Science programs located within the high school or career technical center operated by the local board of education shall be under the auspices of the Kentucky Department of Education, Division of Career and Technical Education. The classroom teacher should maintain documentation of progress toward meeting standards in Career Technical Education. Periodic technical assistance visits, e-mail distribution of information and bi-annual updates shall be provided by the state consultant. Teachers of the program are expected to participate in the summer Career Technical Conference and attend update sessions relating to the program area.

Program improvements and changes should be based on the analysis of assessment data. Health Science teachers should analyze the results of the Kentucky Core Content tests to identify “gaps” in instruction. A breakdown of student results by Career Technical program is a part of the CATS information schools receive and can be obtained for each school in the school profile. Teachers should note student achievement in mathematics, reading, science, practical living and vocational studies.

Any school participating in the *High Schools That Work* network will assess students completing a concentration in a career/technical area. Students in the Health Science program should participate in this assessment. The assessment report includes student survey results and a breakdown of students by program area in reading, mathematics and science. Students meeting the achievement goals in all three areas and meet the Southern Regional Education Board’s curriculum requirements will receive an Award of Educational Achievement from SREB.

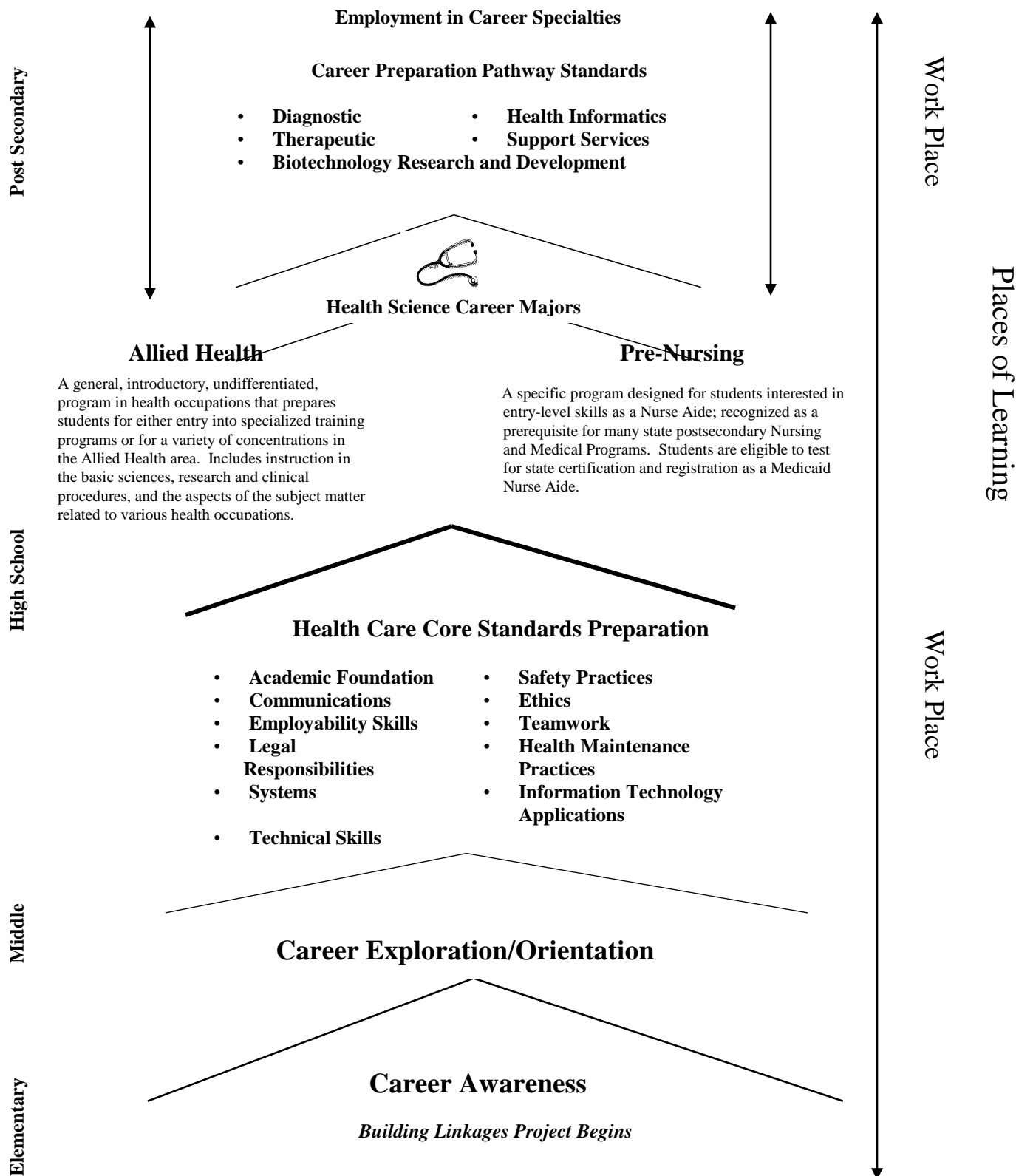
Secondary Health Science programs must annually report student data to the state office. Initial student data is collected by the Technical Education Data System (TEDS) each year. Students are listed according to a career cluster then by career major. **Students, who plan to pursue a career in Nursing or plan to work as a Nurse Aide, and have completed in the MNA course, should use the Pre-Nursing Major. All other students will be pursuing a career major in Allied Health that covers a wide range of occupations.** Students who complete a career major in the Health Science Program will receive a Career Major Certificate.

Career Majors/National Skill Standards

The National Health Care Skills Standards Project has identified standards for a core set of skills that serve as a foundation for occupations and functions across health services. This broad approach avoids duplication of efforts and makes a unique and vital contribution to the initial preparation of health care workers.

National Health Care Core Skill Standards specify the core knowledge and skills needed by health care workers and include the following areas: Academic Foundation, Communication, Systems, Employability Skills, Legal Responsibilities, Ethics, Safety Procedures, Teamwork, Health Maintenance Practices, Technical Skills and Information Technology Applications.

HEALTH SCIENCE EDUCATION CAREER CLUSTER



HEALTH SCIENCE CLUSTER CAREER MAJORS

Allied Health	Pre- Nursing
Recommended Courses	Recommended Courses
Principles of Health Science Medical Math Medical Terminology Medical Science* or Body Structure and Function Health and Wellness** or Holistic Health Emergency Procedures Allied Health Core Skills Advanced HCS/Practicum Pharmacology Medical Microbiology	Principles of Health Science Medical Math Medical Terminology Medical Science* or Body Structure and Function Health and Wellness** or Holistic Health Emergency Procedures Medicaid Nurse Aide Advanced HCS/Practicum Medical Microbiology
Elective Courses	Elective Courses
Food Science Child/Human Development Nutritional Science Psychology/Sociology Child Care Chemistry/Physics Anatomy & Physiology Leadership Dynamics Other Courses directly related to Career Major	Anatomy & Physiology Psychology/Sociology Child/Human Development Medical Office Chemistry/Physics Medical Assisting Leadership Dynamics Other Courses directly related to Career Major

Note:

- **Three credits must come from recommended courses.**
- ***Meets Life Science requirement for high school graduation.**
- ****Meets Health requirement for high school graduation.**

MODEL HEALTH SCIENCE COURSE SEQUENCE

ALLIED HEALTH CAREER MAJOR			
ACADEMIC CORE			
9TH	10TH	11TH	12TH
English	English II	English III	English IV
Algebra I	Geometry	Algebra II	Elective 4 th Math
Health & PE	Science	Science	Science
Social Studies	History & Appreciation of Visual and Performing Arts	Social Studies	Social Studies
TECHNICAL CORE			
↔	Principles of Health Science	Medical Science or Body Structure and Function	Advanced HCS/Practicum
	Medical Terminology	Health and Wellness OR Holistic Health	Allied Health Core Skills
	Emergency Procedures	Medical Microbiology	Medical Math can meet requirements for 4 th math
PRE-NURSING CAREER MAJOR			
ACADEMIC CORE			
9TH	10TH	11TH	12TH
English	English II	English III	English IV
Algebra I	Geometry	Algebra II	Elective
Health & PE	Science	Science	Science
History & Appreciation of Visual and Performing Arts	Social Studies	Social Studies	Social Studies
TECHNICAL CORE			
	Principles of Health Science	Body Structure and Function or Medical Science	Medicaid Nurse Aide
	Emergency Procedures	Medical Terminology	Advanced HCS/Practicum
		Health and Wellness or Holistic Health	Medical Math—can meet the requirements for the 4 th math course

HEALTH AND WELLNESS

INTERDISCIPLINARY APPROACH TO TEACHING HEALTH EDUCATION AND HEALTH SCIENCE

Course Overview:

This one-credit course is designed as an interdisciplinary approach to health education. All content from the high school health and physical education is included along with content from vocational education. The main focus of this course is the promotion of a healthy lifestyle through proper nutrition, physical activities, and lifestyle choices. The course model for health education includes core content from practical living and vocational studies content chart. Activities and extensions for diverse learners are designed to enhance the understanding of all students about holistic health and the healthcare industry. Upon completion of this course, students will be able to answer the question, “How does my physical, mental, and social well-being influence the lifestyle choices I make each day?”

Models are organized around guiding questions. Guiding questions direct teachers’ choices of activities and are the questions students should be able to answer at the end of the course. Pages of models are arranged in pairs. On the left-hand page of each pair are guiding questions along with related academic expectations and correlation to the wellness content chart. Sample activities and sample extensions for diverse learners are found on the right-hand page. While sample activities address *content* or content from elective areas, they are not intended to be comprehensive. Teachers still are responsible for planning instruction to meet the diverse needs of all their students.

Guiding Questions:

- How can I continue to stay healthy?
- How can I develop healthy relationships?
- What do I need to know and be able to do to remain physically healthy and accept responsibility for my own physical well being?
- What strategies can I use to become and remain mentally and emotionally healthy?
- How can my involvement in organized social and recreational activities influence my physical, mental, and emotional health?
- How can I evaluate and use services and resources available in my community?
- What guidelines and influences can I use to evaluate consumer products and services and make effective decisions?

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p>	<p>How can I continue to stay healthy?</p> <p>How can I develop healthy relationships?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • analyze individual actions and interactions within groups. • explain how the functioning of body systems is interrelated. • explain the process of human growth and development. • identify abstinence as the only sure means of preventing pregnancy and sexually transmitted diseases. <p>Physical Education</p> <ul style="list-style-type: none"> • describe how benefits of exercise are interrelated. • establish, develop, and implement a lifetime personal fitness and activity plan. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • describe components of holistic health. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> investigate factors (e.g., heredity, family structure, peers, media) that influence personal behaviors. Distinguish between positive and negative behaviors. Develop and complete individual and group behavior inventories. Evaluate and use results to improve performance within individual and group settings. Write dialogues analyzing behaviors over a three-month period. examine important relationships (e.g., peers, family, church, work, recreational). Examine roles, including strengths and weaknesses of group members. Discuss rights and responsibilities of each member and impact of individuals on groups. Identify needed adjustments to improve relationships. Role-play suggested interactions. <p>Technology suggestion: Use camcorders to videotape presentations.</p> <ul style="list-style-type: none"> research effective interpersonal communication skills in group relationships. Observe diversified age and gender groups in local communities (e.g., workplaces, schools, geriatric facilities). Record and discuss behaviors of group members. Discuss factors that facilitate communication and factors that are barriers. Role-play communications breakdowns and conflict resolutions. Prepare informational brochures for peers that illustrate effective communication skills. <i>Use this activity to develop possible writing portfolio entries (WP - Transactive).</i> Share videos and brochures with parent-teacher organizations, school councils, and local social intervention agencies. <p>Technology suggestions: Use desktop publishing software to create brochures. Use camcorders to film role-playing situations.</p> <ul style="list-style-type: none"> determine typical physical growth patterns. Investigate how behavior impacts growth and wellness. Compare physical growth to other areas of growth (e.g., chronological, intellectual, emotional, social, philosophical). Write personal, reflective essays on ways different individual growth patterns have been impacted by health and wellness (WP - Transactive). 	<p>Students with difficulty understanding or mastering complex words or directions may have picture cards for new vocabulary (e.g., appropriate interrelationship in picture form) and directions limited to no more than five steps. Students are given longer completion times (<i>Types of extensions: resources and materials, complexity</i>).</p> <p>Lela and Peter have been deaf since birth. They communicate through the use of American Sign Language and an interpreter. Their vocabulary, language development and use of language are below age peers. Using concept maps and caption videos that represent some of the concepts of the unit, the teacher reviews words that she anticipates will be used in group discussions and brainstorming activities (e.g., compromise, pros and cons, conflict resolution, priority, goal setting). As they brainstorm and discuss, Lela and Peter sign their contributions as the interpreter voices their ideas. Each group is to turn in notes of its discussion. Copies are made for Lela and Peter to match written language with oral language (<i>Types of extensions: order of learning, routines and procedures, level of support, participation, purpose and appropriateness</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p>	<p>How can I continue to stay healthy?</p> <p>How can I develop healthy relationships?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • analyze individual actions and interactions within groups. • explain how the functioning of body systems is interrelated. • explain the process of human growth and development. • identify abstinence as the only sure means of preventing pregnancy and sexually transmitted diseases. <p>Physical Education</p> <ul style="list-style-type: none"> • describe how benefits of exercise are interrelated. • establish, develop, and implement a lifetime personal fitness and activity plan. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • describe the components of holistic health. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • research life expectancy in Kentucky and U.S. Survey local communities to determine average life expectancy. Compare findings and discuss reasons for likenesses and differences. Design plans and conducts surveys to determine factors (e.g., behaviors, heredity) that contribute to longevity. Discuss quantity versus quality of life. Create histograms comparing data from all fifty states. Desegregate data to show differences among ethnic groups. • investigate factors that contribute to enjoyment of daily activities by older adults. Investigate factors that contribute to long-term enjoyment and active involvement. Investigate interests and activities and record age of first participation. Interview persons enjoying longevity and active involvement. Volunteer at local long-term care facilities. Interview adults about strategies they use for coping with health problems. Write articles on ways to increase enjoyment of activities as one ages. • examine sensory losses that contribute to difficulty in normal functioning. Design and simulate experiments (e.g., glasses with petroleum jelly, cotton in ears, heavy gloves) to experience sensory losses. Write plans to assist persons with sensory losses (<i>WP - Transactive</i>). • investigate role self-esteem plays in individual health and well-being. Design experiments to collect and analyze self-evaluations by peers. Discuss importance of self-esteem in healthy behaviors (e.g., cleanliness, rest, self-image, exercise, sexual behaviors). • investigate structures and functions of organ systems. Compare information in graphic organizers. Create models of each system. Research common diseases of each system and identify successful methods of treatment. Analyze how problems in one system disrupt the functioning of another. Create skits or dialogues depicting interrelationships among organ systems. • research social, emotional, and physical benefits of abstinence. Create public service announcements encouraging abstinence among unmarried teens. • research economic, social, and political issues related to teen pregnancy. Use information to create educational books for younger students about the implications of teen pregnancy. 	

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p>	<p>What do I need to know and be able to do to remain physically healthy and accept responsibility for my own physical well-being?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • develop sound nutritional practices. • evaluate individual wellness. • describe safety prevention, first-aid procedures, and equipment used for common injuries. • explain procedures for handling various emergency situations. • analyze risk-taking choices and actions. • explain disease transmission, prevention, and control. • evaluate personal health practices. • identify abstinence as the only sure means of preventing pregnancy and sexually transmitted diseases. • describe community resources and services. <p>Physical Education</p> <ul style="list-style-type: none"> • describe how benefits of exercise are interrelated. • apply principles of exercise. • apply nutritional concepts in meal planning. • describe benefits of regular participation in physical activities. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • describe components of holistic health. • examine economic, social, cultural, and religious influences on wellness. • utilize activities of the Health Occupations Students of America (HOSA) student organization as an integral component of course content and leadership development. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • develop instruments to evaluate lifestyle practices including regular exercise. Develop personal plans to adhere to sound physical fitness programs. • research impact of peer pressure on behavioral choices (e.g., dieting, drug use, alcohol use). Create and perform skits depicting peer pressure on lifestyle choices. • investigate role nutrition plays in individual health and wellness. Interview nutritionists about importance of reading food labels and pros and cons of various diets. Use information to prepare for public service announcements. <p><i>Technology suggestion: Use camcorders to videotape public service announcements.</i></p> <ul style="list-style-type: none"> • research impact of physical activity on individual health and wellness. Interview school athletes and fitness center directors about relationship of exercise to health. Graph, analyze, and present findings at faculty meetings to encourage participation in fitness activities. <p><i>Technology suggestion: Use integrated software packages or graphing software to create databases and graphs.</i></p> <ul style="list-style-type: none"> • investigate emergency plans and strategies for disaster situations. Simulate mock disaster drills with cooperation of local Emergency Management Service (EMS) Team. Develop scoring guides for participants and rescuers. Review results and implement improvement strategies. • research school-safety measures. Investigate number, type and frequency of accidents in schools. Identify causes and discuss ways to reduce number of accidents. Present plans to school councils and student leadership groups. • investigate first-aid items needed in all kits for school and work sites. Research cost and identify areas that need kits. Purchase items, assemble kits, and distribute to schools, libraries, supermarkets, and recreational areas. 	<p>Students in the gifted and talented program will have the opportunity to shadow healthcare professionals. (<i>Types of extensions: purpose and appropriateness, motivation</i>).</p> <p>Marshall is a paraplegic due to a driving accident at age 10. He uses a motorized wheelchair. In order to build his upper body strength and to decrease the possibility of atrophy, Marshall will develop a fitness survey and collect information regarding upper body conditioning. He will work with a non-disabled partner to develop the survey and a report that is inclusive of other physical needs of individuals with disabilities. In order to visit a fitness center, he uses his special transportation that includes a lift (<i>Types of extensions: purpose and appropriateness, resources and materials, motivation</i>).</p> <p>Students who work better in small groups or require reinforcement may do so. Rules for group conduct and expectations should be posted (<i>Types of extensions: motivation, procedures and routines</i>).</p>

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Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • compare local, state, and national statistics on communicable diseases. Create histograms comparing data from all fifty states. • research common diseases caused by microorganisms. Discuss and implement strategies to reduce spread of diseases. Produce infomercials to share findings. <p><i>Technology suggestion: Use camcorders to videotape commercials or CD-ROMs, laser disks, video, and audio, and digital cameras to create multimedia presentations.</i></p> <ul style="list-style-type: none"> • collect and culture bacteria from various locations in school buildings. Prepare presentations for all health classes explaining how cultures were grown. • design and conduct experiments to test effectiveness of germ fighting hand soaps. Make recommendations to school-based councils and parent-teacher groups on using most effective germ-fighting hand soaps in local schools. • research educational materials and programs (e.g., American Heart Association, American Diabetes Association, American Cancer Society) that promote wellness and prevention. Compare programs and write articles for local newspapers on available materials and programs (<i>WP - Transactive</i>). 	<p>Students will be placed in multi-ability groups for activities (e.g., reading groups for students unable to read at the appropriate reading level) to allow all students to be successful (<i>Type of extensions: appropriateness and purpose, complexity, motivation</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p>	<p>What strategies can I use to become and remain mentally and emotionally healthy?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • determine sources of stress and identify stress related illnesses. • analyze and use stress management strategies. • evaluate conflict resolution and violence prevention strategies. • adopt success-building strategies. • research mental and emotional illnesses. • research substance abuse. • define abuse and determine strategies for prevention. • evaluate health behaviors and attitudes of peers. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • debate issues relating to death and dying. • describe components of holistic health. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> investigate stress and impact of stress on different individuals. Use results to create lists of recommended stress reduction strategies. Research biofeedback techniques of stress management. Compare to traditional methods. Design questionnaires to survey causes of stress among various groups (e.g., young, old, male, female). Examine current events articles related to stress and stress management. Prepare lists of stress-reducing activities. Compile class recommendations in brochures and distribute to students and teachers. research abusive behaviors (e.g., fighting, drug and alcohol use). Compare assertive and aggressive behaviors. Create skits depicting conflict-resolution strategies. <p><i>Technology suggestion: Use camcorders to videotape skits.</i></p> <ul style="list-style-type: none"> research successful personal and business strategies. Interview successful community members. Share findings in steps-to-success brochures. research various cultural and religious groups and their beliefs concerning death and dying. Interview medical examiners, hospital chaplains, hospice volunteers, and funeral directors. Investigate techniques used to lessen impact of grief. Discuss grieving techniques that assist in maintaining good mental health maintenance. Prepare charts depicting how different groups deal with end of life. investigate local, state, and national programs to assist persons with mental and emotional disorders. Create brochures for Youth Services Centers that summarize information. 	

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Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> research substance abuse programs. Interview alcoholics anonymous participants and halfway house members to discuss recovery programs. Collect data on average time for recovery and factors that affect recovery. Investigate peer pressure in relation to substance abuse. Interview psychologists about addictive behaviors. Create dialogues among friends on substance abuse and effects of negative peer pressure. Role-play methods of dealing with peer pressure. Write books for adolescents on dangers of substance abuse (<i>WP - Transactive</i>). Design public service announcements that include addiction-avoidance strategies. <p>Technology suggestions: Use integrated packages or desktop publishing to create books. Use camcorders to videotape role-playing situations and public service announcements.</p>	

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p> <p>Psychomotor Development (2.34)</p>	<p>How can my involvement in organized social and recreational activities influence my physical, mental, and emotional health</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • analyze individual actions and interactions within groups. • explain how the functioning of body systems are interrelated. <p>Physical Education</p> <ul style="list-style-type: none"> • describe how benefits of exercise are interrelated. • establish, develop, and implement a lifetime personal fitness and activity plan. • apply movement concepts in various games, sports, and rhythmic activities. • refine techniques to achieve consistency in performance of fundamental skills in games and activities. • demonstrate sportsmanship applicable to participants and spectators. • demonstrate principles of motor skill refinement. • analyze specialized movement sequences and patterns to make recommendations for improvement. • develop specialized motor skills for participation in rhythmic movement; individual, dual, and team games. and activities. • analyze object manipulation to make recommendations for improvements. • describe benefits of regular participation in physical activities. • apply strategies for successful participation in lifetime activities and sports. • refine techniques in lifetime activities and sports to enhance performance. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • describe components of holistic health.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • participate in team and individual sports and activities (e.g., volleyball, softball, basketball, throwing, catching, tennis, badminton, golf) demonstrating correct movement techniques and adherence to rules of play. Analyze movement via videotapes to help improve performance. Work with partners to perfect techniques (e.g., golf swing, catching, throwing). • use elements of dance (e.g., space, time, force, levels, pathways) to develop creative movement sequence. Participate in rhythmic activities and dance demonstrating movement concepts, sequences, and patterns. <p><i>Technology suggestion: Use camcorders to develop videotapes to critique peer movement.</i></p> <ul style="list-style-type: none"> • use Internet to research biomechanics of movement. Identify major muscle groups used. Record use of muscles through classroom movements and activities. Observe muscles used in different activities (e.g., walking, running, golfing, dancing). Choose the use of one muscle to illustrate in posters. • develop dance sequences in pairs and groups, using three culturally different types of music. Demonstrate for class. • investigate what is meant by good sportsmanship. Use graphic organizers to compare sports heroes' actions. Include those that are considered to be examples of good and poor sportsmanship. Create posters on the do's and don'ts of good sportsmanship. Write sports opinion columns for school newspapers (<i>WP-Transactive</i>). Role-play acceptable sportsmanship behaviors of different sports. • plan and implement activity day where teachers and students compete. • examine community activity careers (e.g., YMCA). Prepare consumer guides explaining benefits of these centers and resources they provide. Write letters to community leaders persuading them to fund more centers (<i>WP-Transactive</i>). • develop and plan community activities (e.g., bowl-a-thon, marathon). Research location, cost, volunteer resources, and safety. Plan for involvement of all age groups. Produce written proposals containing all pertinent information and present to local government for approval <p><i>Technology suggestion: Use multimedia resources to make presentations.</i></p>	

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p> <p>Psychomotor Development (2.34)</p>	<p>How can my involvement in organized social and recreational activities influence my physical, mental, and emotional health?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • analyze individual actions and interactions within groups. • explain how the functioning of body systems is interrelated. <p>Physical Education</p> <ul style="list-style-type: none"> • describe how benefits of exercise are interrelated. • establish, develop, and implement a lifetime personal fitness and activity plan. • apply movement concepts in various games, sports, and rhythmic activities. • refine techniques to achieve consistency in performance of fundamental skills in games and activities. • demonstrate sportsmanship applicable to participants and spectators. • demonstrate principles of motor skill refinement. • analyze specialized movement sequences and patterns to make recommendations for improvement. • develop specialized motor skills for participation in rhythmic movement; individual, dual, and team games, and activities. • analyze object manipulation to make recommendations for improvements. • describe benefits of regular participation in physical activities. • apply strategies for successful participation in lifetime activities and sports. • refine techniques in lifetime activities and sports to enhance performance. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • describe components of holistic health.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • examine studies comparing health of persons who regularly engage in sports related activities to those who live sedentary lifestyles. Compare medical expenditures of classmates who participate in physical activities (e.g., ball, dance, golf, swimming) to non-active individuals. Debate benefits of physical activity. Create presentations for classmates convincing them to participate in sports. • investigate community recreational opportunities (e.g., baseball, golf, swimming, square dancing). Design and conduct surveys to determine community participation (e.g., frequency, age level). Design brochures to explain benefits of participation in recreational activities. • compare training programs of amateur sports figures to those of professional sports figures. Interview professionals to discover how they became successful. Create how-to booklets or articles for amateurs. <p><i>Technology suggestion: Use camcorders to videotape presentations.</i></p>	

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p>	<p>How can I evaluate and use services and resources available in my community?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • describe community resources and services. • analyze community health standards and regulations. • identify ways to protect the environment. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • compare public and private healthcare facilities, including an analysis of level of care, cost, and services provided. Interview leaders of communities using public and private healthcare services. Determine if needs are met by existing services and facilities. Investigate public healthcare facility guidelines. Create charts outlining standards and regulations for each health care cluster. Develop multimedia presentations for healthcare administrators. <p><i>Technology suggestion: Use camcorders to videotape commercials or CD-ROMs, laser disks, video, and audio, and digital cameras to create multimedia presentations.</i></p> <ul style="list-style-type: none"> • research and develop directories of local and state health care agencies and resources. Work with Youth Services Centers to distribute information to parents. Collaborate with businesses to create presentations of community resources. Share with local magistrates and chamber of commerce or tourism commissions. • investigate local water and sewage treatment plants. Write articles explaining potential health issues related to unsafe water supplies (<i>WP - Transactive</i>). • develop questionnaires concerning volunteerism rates among peers. Write volunteer agencies requesting information about services and guidelines for volunteers. Interview recipients of volunteer help. Write articles for school newspapers encouraging peers to volunteer their services to those in need (<i>WP - Transactive</i>). 	<p>Nathan's transition goals include volunteering after he leaves high school. He recognizes functional words in his environment. He will need supportive assistance for daily activities as an adult. Working with a non-disabled peer, he chooses two volunteer agencies based on his interests (e.g., Humane Society and local hospital). They visit the agencies to observe possible roles that he can perform as a volunteer and take pictures. With assistance from his peer, he prepares a bulletin board. As a part of high school program, he begins volunteering two hours per week (<i>Types of extensions: purpose and appropriateness, complexity, size, environment, level of support, demonstration of knowledge, participation, motivation</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Individual Well-Being (2.29)</p> <p>Physical Wellness (2.31)</p> <p>Lifetime Activity (2.35)</p>	<p>What guidelines and influences can I use to evaluate consumer products and services and make effective conscious decisions?</p>	<p>Students will</p> <p>Health Education</p> <ul style="list-style-type: none"> • develop and use strategies for evaluating products and services. • evaluate influences of advertising on consumer choices. • make effective consumer decisions. • apply nutritional concepts in meal planning. <p>Wellness Content Chart</p> <ul style="list-style-type: none"> • examine economic, social, cultural, and religious influences on wellness. • describe components of holistic health. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> investigate factors affecting consumer decision making. Survey peers to determine highest priority (e.g., cost, packaging, quantity, quality, advertising) when selecting products or services for personal use. Graph and analyze findings. Write articles for consumer newsletters explaining purchasing decisions of youth (<i>WP - Transactive</i>). investigate behaviors that represent conflicting values (e.g., convenience of automobiles and importance of clean air). Develop plans to lessen impact of identified conflicts. analyze nutritional information on food labeling. Collect food product labels. Create spreadsheets to organize data. Analyze and discuss percentages of different nutrients in food items. Develop balanced, low-fat diets and publish in brochures. Distribute at local supermarkets (<i>WP-Transactive</i>). investigate advertising techniques. Collect, compare and analyze various newspaper, magazine, and TV advertisements. Create bulletin boards contrasting positive and negative advertisements. Plan weekend camping trips, create budgets, and apply decision-making process to purchase necessary items. Discuss choices and evaluate decisions. 	<p>Jason is a diabetic with numerous food allergies. He collects and analyzes product labels paying particular attention to the nutritional content and ingredients while comparing to his personal health needs. His brochure focuses on special considerations for individuals like himself. He shares his findings with the local health department's nutritionists and creates a Web site for adolescents with similar health issues and makes it available through the school's Web site (<i>Types of extensions: purpose and appropriateness, complexity, size, demonstration of knowledge, motivation, resources and materials, participation</i>).</p>

MEDICAL SCIENCE

[INTERDISCIPLINARY APPROACH TO TEACHING LIFE SCIENCE AND HEALTH SCIENCE]

Course Overview:

This one-credit course uses health occupations as a vehicle to present the life science content outlined in the *Program of Studies*. The course is interdisciplinary in nature and integrates academic expectations and activities with the disciplines of life science, mathematics, health, social studies, language arts, arts and humanities, and vocational studies. During their study of medical science, students will gain an understanding of the normal structure and function of the human body through scientific inquiry. Life science conceptual understandings, applications, and connections make this science relevant to students. Anatomy, physiology, physics, and chemistry concepts are reinforced with real-life analogies and health-related examples are used to illustrate potentially difficult scientific concepts.

Models are organized around guiding questions. Guiding questions (in bold print) direct teachers' choices of activities and are the questions students should be able to answer at the end of the course. Essential questions may be included to further focus student learning.

Pages of models are arranged in pairs. On the left-hand page of each pair are guiding and essential questions along with related academic expectations and correlations to the *Program of Studies* and medical science content chart. Sample activities and sample extensions for diverse learners are found on the right-hand page. While sample activities address content or content from elective areas, they are not intended to be comprehensive. Teachers still are responsible for planning instruction to meet the diverse needs of all their students.

Guiding and Essential Questions:

How do cell structure, function, and processes affect living things?

- What disease processes result from changes in my body's cell structure and functions?

What is the molecular basis of heredity?

- How do errors in decoding and transmission of genetic traits affect my health?

What are the processes of biological change?

- How does aging affect the functioning of my body systems?
- How does the function of microorganisms in my world affect me?

How are organisms within ecosystems interdependent?

- What is my role in the cycling of matter and the flow of energy through ecosystems?
- What is my role in an ecosystem?
- How are chemical reactions responsible for the maintenance, growth, and development of my body?

How do body systems work together to keep me healthy and active?

- How does my body maintain homeostasis?

Why do organisms behave the way they do?

- How does my environment affect my behavior?
- What factors determine my marital status and the size of my family?

Why is a knowledge of chemistry and physics necessary in medical careers?

- How will participation in student organizations help prepare me for a career in health care?

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>How do cell structure, function, and processes affect living things?</p> <p>What disease processes result from changes in my body's cell structure and functions?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> investigate cell structures and their functions. investigate cell regulation, differentiation, and how the process of photosynthesis provides a vital connection between the Sun and energy needs of living systems. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> identify and refine questions and identify scientific concepts. design and conduct different kinds of scientific investigations. use equipment, tools, techniques, technology, and mathematics. use evidence, logic, and scientific knowledge. communicate designs, procedures, and results. review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> examine the interaction between science and technology. explore the impact of science on personal and community health. analyze how science and technology are necessary for solving issues. recognize that scientific knowledge is subject to change. investigate advances that have effects on science and society. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> identify and analyze human body systems and the ways their components work together or affect each other. classify major disease processes affecting each body system. relate medical terminology to body organs and systems. investigate radioisotopes in the treatment and diagnosis of disease.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • create cell models, using nontoxic, biodegradable materials, to illustrate appearance and position of various organelles within cells. Produce keys that include descriptions of organelle functions. • trace path of molecules (e.g., glucose, water) as they arrive at cell membranes and move through cells. Create bulletin boards demonstrating movement. • examine slides of various cell types from multi-cellular organisms. Discuss relationships between structure of different cell types and their functions. Determine what structure and functions all cells have in common. • compare functions of cell organelles to school or city structures that have similar functions. Create multimedia presentations showing comparisons. • research common diseases (e.g., cancer, influenza, diabetes, cystic fibrosis). Trace disease processes to changes in organ systems or cells. Develop informational brochures that describe diseases and changes they cause at the cellular and organ levels. Distribute brochures through county health departments. • investigate how and when cells differentiate. Read “How Does a Single Cell Become a Whole Body.” Trace formation of germ layers and identify organ systems that develop from each layer. Create informational bulletin boards, collages or posters. Examine drugs (e.g., thalidomide, alcohol) and diseases (e.g., rubella) that interfere with differentiation and organogenesis. Explain U.S. governments’ recommendation that pregnant women abstain from drinking alcohol. Write articles to encourage pregnant women not to drink. <i>Use this activity to develop possible writing portfolio entries (WP - Transactive).</i> • investigate organ systems (e.g., respiratory, digestive). Work in small groups to create physical models of systems. Research major diseases of each body system and methods used to diagnose and treat diseases (e.g., radioisotopes, surgery, drugs). Analyze how breakdown or disease in one system affects others. <p>Technology suggestions: Use Internet to conduct research. Create multimedia presentations for peers describing structure, function, and major diseases of each system.</p>	<p>Bill has difficulty expressing concepts in written form, but works well with manipulatives. Provide Bill various materials to create cell models. Models may be patterned on easily recognizable pictures (<i>Types of extensions: resources and materials, demonstration of knowledge</i>).</p> <p>Alicia has difficulty understanding complex words or directions. Provide her with picture cards to introduce new vocabulary and limit directions to three steps at a time. Alicia will need additional time to complete assignment (<i>Types of extensions: resources and materials, complexity</i>).</p> <p>Cameron, Bart, Amanda and Alicia need opportunities to research and apply advanced level findings to real problems (e.g., they need to practice good listening skills). These students will prepare and participate in formal debates on whether the U.S. government should recommend that pregnant women abstain from drinking alcohol (or using other substances which interfere with differentiation and organogenesis). The teacher may stipulate that students will not know whether they represent affirmative or negative sides until day before debate (<i>Types of extensions: purpose and appropriateness, complexity, time, resources and materials, procedures and routines, demonstration of knowledge</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>What is the molecular basis of heredity?</p> <p>How do errors in decoding and transmission of genetic traits affect my health?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> • investigate DNA. • investigate encoding and replication. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use equipment, tools, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • apply scientific inquiry and conceptual understandings to solving problems of technological design. • examine the interaction between science and technology. • explore the impact of science on personal and community health. • use science to investigate hazards. • analyze how science and technology are necessary for solving issues. • analyze the role science plays in everyday life and compare different careers in science. • recognize that scientific knowledge is subject to change. • investigate advances that have effects on science and society. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • relate radioisotopes to the treatment and diagnosis of disease. • apply mathematics, science and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • create and use models to illustrate DNA structure, replication, and protein synthesis. Investigate mutation by substituting DNA bases. Using models, demonstrate how changes in DNA affect structure of proteins and cause genetic disorders. Develop informational brochures on genetic disorders describing diseases, their inheritance patterns, and community resources for interested families. Distribute brochures through Youth Services Centers (<i>WP - Transactive</i>). • compare observed and expected outcomes of genetic crosses using both Punnett squares and basic probability. Create pedigree charts for observable genetic traits (e.g., tongue rolling, widow's peak, hitchhiker's thumb) or disorders. Include at least three generations. Use information from families, acquaintances, or history (e.g., hemophilia in descendants of Queen Victoria) to create charts. Role-play genetic counselors. Conduct mock counseling sessions for couples with histories of genetic problems. <p>Technology suggestions: <i>Use Internet to conduct research. As alternative to brochures, students could develop multimedia presentations.</i></p> <ul style="list-style-type: none"> • investigate factors (e.g., radiation) that alter DNA. Research effects of radiation on Japanese after the bombing of Hiroshima and Nagasaki. Read <i>Hiroshima</i> and discuss impacts of bombing on individuals and Japanese society. Correspond with survivors and their families about problems they still face. <p>Technology suggestion: <i>Communicate with survivors via e-mail.</i></p> <ul style="list-style-type: none"> • research ways radiation can be used to diagnose and treat diseases. Shadow radiation technologists at local healthcare facilities. Create brochures on medical uses of radiation for distribution at healthcare facilities (<i>WP-Transactive</i>). 	<p>Moses and Molly are two students in the gifted and talented program. They have demonstrated mastery with many basic biology concepts. They should be provided opportunities to shadow genetic counselors (<i>Types of extensions: purpose and appropriateness, motivation</i>).</p> <p>Lum is an avid reader and history enthusiast. He has extensive knowledge of events surrounding WWII in the South Pacific. Allow him to select projects that will extend his knowledge (<i>Types of extensions: participation, pace</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>What are the processes of biological change?</p> <p>How does aging affect the functioning of my body systems?</p> <p>How does the function of microorganisms in my world affect me?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> • examine how species change over time. • examine diversity and classification. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use tools, equipment, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • apply scientific inquiry and conceptual understandings to solving problems of technological design. • examine the interaction between science and technology. • explore the impact of science on personal and community health. • recognize how science influences human population growth. • investigate how science can be used to solve environmental quality problems. • use science to investigate hazards. • analyze how science and technology are necessary for solving issues. • recognize that scientific knowledge is subject to change. • investigate advances that have effects on science and society. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • relate medical terminology to body organs and systems.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> research and summarize theories about origin of life. Survey community members to determine their beliefs. Read articles and literature (e.g., <i>Summer for the Gods</i>) regarding the teaching of evolution. Collect data and create bar graphs, showing differences among groups (e.g., male, female, African Americans, American Indian). Write personal essay describing their own beliefs. Debate issues related to different theories. Write editorials for school newspapers supporting beliefs on the teaching of evolution (<i>WP - Transactive</i>). research news and magazine articles that document microorganisms' resistance to drugs (e.g., antibiotics). Investigate difficulties researchers have in developing vaccines for diseases (e.g., HIV, malaria, common cold, influenza). Interview doctors and pharmacists on proper use of antibiotics. Create flyers or posters to display in drugstores. research frequency of genetic disorders (e.g., sickle-cell anemia in African Americans, cystic fibrosis in Caucasians, methemoglobinemia in Eastern Kentuckians) prevalent in different segments of human population. Create graphs comparing county, state, and national data. Identify factors responsible for prevalence of these disorders within different segments of population. Research cause and inheritance patterns of these disorders and medical tests used to identify genetic disorders in newborns. Create public service announcements for local radio or television stations to increase community knowledge of these disorders. Use Internet to conduct research. See The Nation's Prevention Agency Center for Disease Control. http://www.cdc.gov/default.htm See Center for Disease Control and Prevention: Health Information http://www.cdc.gov/diseases/diseases.html investigate potential causes of changes in human gene pool. Debate how modern technologies (e.g., expensive medical treatments, genetic engineering, genetic testing) and lifestyles affect human gene pool. observe microorganisms (e.g. bacteria, dinoflagellates, protozoans). Investigate beneficial and detrimental roles microorganisms play in environment (e.g., fermentation, food spoilage, diseases, decay, bioluminescence, food digestive processes, production of vitamins and antibiotics, nitrogen fixation). Create illustrated children's books describing microorganisms and their roles (<i>WP - Transactive</i>). 	<p>Jay and Rhonda enjoy research and are interested in genetics. They work better in small groups and require reinforcement. Rules for group conduct and expectations should be posted and reinforcements provided (<i>Types of extensions: motivation, procedures and routines</i>).</p> <p>Since her accident, Jimmie Dee needs additional time to complete assignments. She will do an in-depth study of one organism, using visual aids and posters with steps outlined (<i>Types of extensions: complexity, time, magnitude, environment</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>How are organisms within ecosystems interdependent?</p> <p>What is my role in the cycling of matter and the flow of energy through ecosystems?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> • investigate the cycle of atoms and molecules within the biosphere. • analyze energy flow through ecosystems. • analyze the flow of matter and energy. • investigate behavioral responses. • explore how human activities alter ecosystems. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use tools, equipment, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • examine the interaction between science and technology. • explore the impact of science on personal and community health. • analyze the role science plays in everyday life and compare different careers in science. • investigate advances that have effects on science and society. • use science to analyze the use of natural resources. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • relate importance of chemistry and physics to students studying the health professions and to various body processes.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> investigate relative abundance of carbon, hydrogen, nitrogen, and oxygen in living things. Identify major compounds found in living things (e.g., CO₂, H₂O, proteins, carbohydrates). Trace movement of these elements between living and nonliving world. Identify critical processes (e.g. respiration, photosynthesis, bacterial role in nitrogen cycle) to each cycle. Assume role of elements or molecules as they cycle through the biosphere. (Element or molecule must pass through at least two organisms.) Develop skits and present to class. <p><i>Technology suggestion: Use camcorders to videotape skits.</i></p> <ul style="list-style-type: none"> design food chains showing humans' position as primary and secondary consumers. Use food chains to construct food webs. Analyze humans' position in energy transfer. Compare vegetarian and non-vegetarian diets to determine effects of each on the environment. Determine ingredients needed to produce a cow, including land, forage, fuel, fertilizers, corn, soybeans, insecticides, herbicides, antibiotics, hormones, and water. Write newspaper editorials explaining the distribution and use of resources among nations of the world (<i>WP - Transactive</i>). research methods used to determine number of calories in foods. Determine number of calories in walnuts by burning the walnuts beneath test tubes filled with water. Compare water temperature before and after burning. Compare number of calories released by lipids, proteins, and carbohydrates. Write informational articles for dieters explaining which type of food provides the most calories and why (<i>WP-Transactive</i>). investigate mechanisms for heat gain and loss in humans. Research malfunctions in human thermoregulatory system (e.g., heat exhaustion, heat stroke) and use of induced hypothermia during surgery. Design activities to compare effects of physical activity and external environmental stimuli (e.g., temperature, layer of clothing) on regulation of body temperature. Create graphs to illustrate results. <p><i>Technology suggestions: Use computer-based laboratory equipment to collect data and create graphs.</i></p>	<p>Ann has scored well on a pretest of biology topics. She should be allowed to be a peer tutor for other students in the class and select her own research project. Ann will work with ecologists at the local university research farms to investigate populations of grasses. (<i>Types of extensions: participation, order of learning, level of support</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>How are organisms within ecosystems interdependent?</p> <p>What is my role in an ecosystem?</p> <p>How are chemical reactions responsible for the maintenance, growth, and development of my body?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> • examine the factors that influence the interactions between organisms. • recognize that living systems require energy. • investigate photosynthesis, cellular respiration, and energy. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use tools, equipment, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • apply scientific inquiry and conceptual understandings to solving problems of technological design. • explore the impact of science on personal and community health. • recognize how science influences human population growth. • investigate how science can be used to solve environmental quality problems. • use science to investigate hazards. • analyze how science and technology are necessary for solving issues. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • relate importance of chemistry and physics to students studying various body processes and the health professions. • identify and analyze human body systems and how their components work together or affect each other.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • design self-contained ecosystems that support six people. List organisms required to keep ecosystems functioning for three years. Explain role of each organism. Create dioramas of ecosystems. Create and maintain living systems containing at least one producer and one consumer. • compare anaerobic to aerobic respiration. Compare amount of energy produced, chemical reactions, factors affecting rates, location of reactions, and types of cells that carry out each. • explore diversity among microorganisms. Research types of aerobic and anaerobic bacteria (e.g., <i>Staphylococcus aureus</i>, <i>Clostridium botulinum</i>). Discuss potential impacts on human health (e.g., botulism, vitamin K production). Research and categorize antimicrobial drugs. Investigate how antimicrobial drugs disrupt cell processes and/or structures. Create informational brochures explaining how antimicrobial drugs work and distribute at drugstores. • investigate dietary disorders (e.g., anorexia, malnutrition, bulimia) or dietary choices (e.g., vegetarian, diabetic, fad). Identify their effects on cells and organ systems. Write informational brochures for people suffering from these diseases or considering these dietary choices. Interview local healthcare professionals to determine nutritional problems in communities. Create action plans to solve problems and present to health classes. • investigate structure and function of enzymes. Create physical models to illustrate action of enzymes. Investigate how factors, such as temperature, pH, and substrate concentration affect enzyme activity. Use models to illustrate findings. • explore how toxins interfere with chemical reactions in humans. Investigate milk sickness and its historical importance. Read “Land of Milk and Poison” and discuss how medical detectives solved the mystery of milk sickness. Write short stories about how doctors and other healthcare workers solve mysteries of other diseases. • research process of fermentation. Investigate uses and misuses of fermentation products. Make bread and create children’s books explaining the process (<i>WP - Transactive</i>). • create flow charts illustrating path of energy from Sun to humans and from humans to environment. Label charts, identifying major processes involved in each energy transformation. 	<p>Phyllis does not read at the level of her same-age peers. She should be placed in multi-ability groups for activities that require sustained reading (<i>Type of extensions: purpose and appropriateness, complexity, motivation</i>).</p> <p>The teacher is aware that incidences of bulimia and anorexia are significantly higher among intellectually gifted females than among other females. She has assigned clusters of gifted girls to investigate effects of these disorders on cells and organ systems, including their etiologies and treatment. Their activities include meeting with counselors trained in needs of these students for extended discussions related to setting personal goals and dealing with dilemmas of developing talents versus being popular. They will share their presentation with middle school girls selected by gifted and talented specialists (<i>Types of extensions: purpose and appropriateness, motivation, level of support, resources and materials, environment, demonstration of knowledge</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>How do body systems work together to keep me healthy and active?</p> <p>How does my body maintain homeostasis?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> • investigate behavioral responses. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use tools, equipment, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • apply scientific inquiry and conceptual understandings to solving problems of technological design. • examine the interaction between science and technology. • explore the impact of science on personal and community health. • analyze the role science plays in everyday life and compare different careers in science. • recognize that scientific knowledge is subject to change. • investigate advances that have effects on science and society. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • explain how lungs and kidneys help maintain constant and proper blood pH. • describe acid/base balance of the human body. • compare body fluids and their functions.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> investigate fluid and electrolyte balance. Compare percentages and types of body fluids (e.g., intracellular, extracellular, interstitial, plasma). Identify basic concepts of fluid and electrolyte regulation. Investigate hormonal control. Compare symptoms of water excess and water depletion. Investigate water and salt loss in athletes. Compare sports drinks for important electrolytes. Explain why adequate fluid replacement during exercise is important. investigate three processes carried out by kidneys (e.g., filtration, reabsorption, secretion). Investigate effects of alcohol and drugs (e.g., diuretics, caffeine) on excretory system. Research how aging affects kidney functions. Create physical models of mammalian kidney to illustrate functions. Interview dialysis patients about the procedure and how it affects their lives. identify types of acids and bases in the body. Explore buffers and buffer systems (e.g., protein, carbonic acid-bicarbonate, phosphate). Recognize that buffer systems provide only temporary solutions. Investigate how pulmonary mechanisms and renal mechanisms work together to maintain acid-base balance. Investigate disturbances of acid-base balance (e.g., emphysema, renal failure, heart failure, hypertension, neural damage). research how severe diarrhea can affect blood pH, urine pH, and breathing patterns. Create models of human colon to illustrate importance of its structure to control diarrhea. <p>Technology suggestions: Use software programs that show three-dimensional views of human anatomy.</p>	<p>Frank is interested in the effects of exercise on physiological functions, but he understands information presented in concrete manners using simple languages. Frank should receive extra support in strategies to improve his vocabulary development. As motivating tasks, Frank will work with college trainers to observe highly-skilled athletics (<i>Types of extensions: motivation, resources and materials</i>).</p> <p>Carole, Dianna, and Jamahl have expressed desires to become medical doctors. To expose them to fields of medical research and medical practice, these students will be matched with medical researchers under whose supervision they will learn to use state of the art research instruments and procedures to investigate topics agreed upon by researcher, student, and teacher. They will interview and shadow doctors in selected specialty areas. Each student will prepare poster board reports of their activities and career preparation, including options in selected fields (<i>Types of extensions: purpose and appropriateness, environment, level of support, participation, resources and materials, demonstration of knowledge, motivation</i>).</p>

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>Why do organisms behave the way they do?</p> <p>How does my environment affect my behavior?</p> <p>What factors determine my marital status and the size of my family?</p>	<p>Students will</p> <p>Life Science</p> <ul style="list-style-type: none"> • investigate behavioral responses. • analyze patterns of behavior. <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use tools, equipment, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • recognize how science influences human population growth. • investigate how science can be used to solve environmental quality problems. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • identify and analyze human body systems and how their components work together or affect each other. • relate medical terminology to body organs and systems. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> research studies done on identical twins separated at birth and raised apart. Compare personalities, mannerisms, habits, and interests of twins. Debate nature-versus-nurture controversy. investigate and compare innate and learned behaviors (e.g., habituation, imprinting, classical and operant conditioning) in graphic organizers. Create multimedia presentations illustrating examples of each. <p><i>Technology suggestion: Use CD-ROMs, digital cameras, computers, video, and audio to create multimedia presentations.</i></p> <ul style="list-style-type: none"> compare advantages and disadvantages of sexual reproduction and asexual reproduction. Explain adaptive advantages of hermaphroditism, altruistic behavior, and mating systems (e.g., polygamy, polyandry, monogamy). Investigate evolution of behavioral patterns that (e.g., breeding seasons, mating behaviors) affect reproductive success of populations. explore how growth of the human population is different from that of other species. Investigate how human activities have affected selected factors (e.g., climate, food shortages, accidental injuries, infectious diseases, predators) that control lives and numbers of other animals. Investigate and graph exponential growth of the human population since 1500s. Investigate warning signals (e.g., ozone depletion, global warming, air and water pollution, loss of biodiversity) that the human population has reached Earth's carrying capacity for the demands of our species. Investigate factors that govern human reproduction (e.g., social mores, traditional beliefs, economics). Debate the question: Have we reached Earth's carrying capacity for the demands of our species? 	

Academic Expectations	Guiding Questions	Correlations to the Program of Studies
<p>Scientific Ways of Thinking and Working, Patterns, Systems, Scale and Models, Constancy, and Change Over Time (2.1 - 2.6)</p>	<p>Why is knowledge of chemistry and physics necessary in medical careers?</p> <p>How will participation in student organizations help prepare me for a career in health care?</p>	<p>Students will</p> <p>Scientific Inquiry</p> <ul style="list-style-type: none"> • identify and refine questions and identify scientific concepts. • design and conduct different kinds of scientific investigations. • use equipment, tools, techniques, technology, and mathematics. • use evidence, logic, and scientific knowledge. • communicate designs, procedures, and results. • review and analyze scientific investigations. <p>Applications/Connections</p> <ul style="list-style-type: none"> • analyze the role science plays in everyday life and compare different careers in science. • investigate advances that have effects on science and society. <p>Medical Science Content Chart</p> <ul style="list-style-type: none"> • relate importance of chemistry and physics to students studying the health professions and to various body processes. • utilize activities of the Health Occupation Students of America (HOSA) student organization as an integral component of course content and leadership development. • apply mathematics, science, and communication skills to technical content.

Sample Activities	Sample Extensions for Diverse Learners
<p>Students will</p> <ul style="list-style-type: none"> • develop career notebooks describing educational requirements for health related careers, job opportunities, salaries, opportunities for advancement, and job descriptions. <p><i>Technology suggestion: Use career and desktop publishing software to create notebooks.</i></p> <ul style="list-style-type: none"> • design demonstrations to illustrate chemical basis of clinical procedures and tests (e.g., urinalysis, blood sugar, home pregnancy tests, pH of body fluids). • investigate the relationship between pressure and volume. Demonstrate these relationships using medical equipment (e.g., sphygmomanometer, spirometer). Design models to demonstrate breathing process. Record written explanations of processes in learning logs. • participate in local, regional, state, and national Health Occupations Students of America (HOSA) leadership conferences and competitions. 	<p>Faith learns best when she can discuss ideas with her peers. She will work in cooperative learning groups when participating in state competitions (<i>Types of extensions: level of support</i>).</p>

ADVANCED HEALTH CARE SKILLS/PRACTICUM

Course Description: Advanced Health Care Skills is an expanded practical application of health care skills integrated and enriched for the refinement of academic skills. Following successful completion of the Allied Health Core Skills or Medicaid Nurse Aide course, the student will select a career major (Allied Health or Pre-Nursing) for concentrated study and skill development. The course includes a culminating project based on the selected career major. A work-based practicum is designed to compliment the classroom instruction. Students will be required to follow agency requirements for attendance and health screenings. (These may include but are not limited to: drug screens, TB skin test, immunization certificate including Hepatitis B.) Prerequisite courses are Principles of Health Science and Emergency Procedures is strongly recommended. A career major certificate is awarded to students who successfully complete the culminating project and complete 3 credits in the Health Science program and a related credit (i.e., Computer Applications).

Academic Expectations	Content/Process
<p>6.1 2.36 2.37 6.1 6.2 2.37 2.18</p> <p>1.1 2.37 4.1 5.1 1.2 1.12 1.11 2.36 1.11; 1.12</p>	<p>Students will</p> <ul style="list-style-type: none"> • complete specific job tasks related to career major. • complete a personal profile. • complete a training plan in conjunction with practicum employer • integrate knowledge from classroom instruction with work experience. • observe health care facilities and equipment use unavailable in the classroom. • design a plan to increase employability after graduation. • develop a financial plan to allocate funds for personal, education and/or professional expenses. • investigate employment opportunities and responsibilities of health care workers. • develop work habits necessary for individual maturity and job competence. • interact successfully with co-workers, supervisors and classmates. • create a plan for productive time management. • interpret instructional manuals. • discuss articles from professional journals. • create an acceptable work-related report. • formulate a plan for post-secondary education.. • prepare a written and oral culminating report based on experiences in health science program.
<p>4.2 1.16 6.1 2.38</p>	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • demonstrate employability and social skills relevant to health careers.
<p style="text-align: center;">Connections</p> <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • Secretary's Commission on Achieving Necessary Skills (SCANS) • National Health Care Skill Standards • Kentucky Core Content for Assessment 4.0 	

ALLIED HEALTH CORE SKILLS

<p>Course Description: Allied Health Core Skills is designed to provide knowledge, concepts and psychomotor skills necessary for gainful employment as an entry-level health care worker. Assisting students in selecting a career major, classroom instruction and educational objectives are combined with learning experiences and observations and clinical rotations. This course is designed for students not enrolled in the Medicaid Nurse Aide program and who have completed Principles of Health Science and Emergency Procedures.</p>	
Academic Expectations	Content/Process
1.3; 1.4 4.2 2.37 2.14 2.14 2.16 2.31 2.14 2.15 6.2 1.11 2.20 3.4 5.2	<p>Students will</p> <ul style="list-style-type: none"> • develop and practice effective oral and written communication skills. • understand the roles and responsibilities of individual members of the health care team. • prepare supplies, equipment and client for procedures according to facility protocol. • use accepted ethical practices with respect to cultural, social and ethnic differences. • discuss legal responsibilities, limitations, and the implications of actions within the health care delivery setting. • examine how key systems relate to the services performed and affect the quality of client care. • prevent injury or illness through safe work practices and following health and safety policies and procedures. • demonstrate professional etiquette and responsibility. • demonstrate knowledge of applicable laws, statutes or regulations in the career major area. • demonstrate performance skills as outlined on approved practicum task list. • assess client health status according to respective professional standards and report results to treatment team. • research the history and organizational structure of the career practicum area. • demonstrate the effective use of time management skills. • develop a plan to maintain and upgrade skills.
4.2 1.16 6.1 2.38	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • demonstrate employability and social skills relevant to health careers.
<p style="text-align: center;">Connections</p> <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • National Health Care Skill Standards • Omnibus Budget Reconciliation Act (OBRA) Guidelines • Secretary's Commission on Achieving Necessary Skills (SCANS) • Kentucky Core Content for Assessment 4.0 	

BODY STRUCTURE AND FUNCTION

Course Description: This course is designed to provide knowledge of the structure and function of the human body with an emphasis on normalcy. The interactions of all body systems in maintaining homeostasis will promote an understanding of the basic human needs necessary for health maintenance. Academic knowledge from life science core content as it relates to the human body will be included. Laboratory activities should be a part of the course when appropriate.	
Academic Expectations	Content/Process
	Students will:
2.3	<ul style="list-style-type: none"> describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
5.3	<ul style="list-style-type: none"> compare relationships among cells, tissues, organs, and systems.
5.3	<ul style="list-style-type: none"> explain body planes, directional terms, quadrants, and cavities.
2.3	<ul style="list-style-type: none"> analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
2.2	<ul style="list-style-type: none"> compare selected diseases/disorders including respective classifications (s), causes, diagnoses, therapies, and care/rehabilitation to include biotechnological applications.
2.2	<ul style="list-style-type: none"> analyze methods to control the spread of pathogenic microorganisms.
2.6	<ul style="list-style-type: none"> contrast various types of immunities.
2.3	<ul style="list-style-type: none"> analyze body system changes in light of diseases, disorders, and wellness.
2.2	<ul style="list-style-type: none"> compare the aging process among the body systems.
2.16	<ul style="list-style-type: none"> analyze the cause and effect on health care system change based on the influence of: technology, epidemiology, bio-ethics, socioeconomics, and various forms of complimentary (non-traditional) medicine
2.6	<ul style="list-style-type: none"> apply Standard Precautions as described in the rules and regulations set forth by OSHA
2.2	<ul style="list-style-type: none"> contrast medical and surgical asepsis
4.2	<ul style="list-style-type: none"> utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development.
1.16	<ul style="list-style-type: none"> use information technology applications as appropriate to health care specialties.
6.1	<ul style="list-style-type: none"> integrate literacy and numeracy concepts and processes across all curricular units
2.38	<ul style="list-style-type: none"> demonstrate employability and social skills relevant to health careers.
Connections <ul style="list-style-type: none"> Kentucky Occupational Skill Standards Secretary's Commission on Achieving Necessary Skills (SCANS) National Health Care Skill Standards Kentucky Core Content for Assessment 4.0 	

EMERGENCY PROCEDURES

Course Description: This course will focus on potential emergency situations. It is designed to promote an understanding of standard precautions necessary for personal and professional health maintenance and infection control. Upon successful completion of the course, the student will demonstrate the necessary skills in First Aid and Cardiopulmonary Resuscitation (CPR) and will be given the opportunity to take the completion examination as outlined by the sponsoring agency.	
Academic Expectations	Content/Process
6.2 5.1 2.14 5.1 5.1 1.5-1.9 5.3 5.1 5.1 2.18 2.33	Students will <ul style="list-style-type: none"> • demonstrate proper emergency rescue and transport procedures. • analyze emergency situations and determine appropriate emergency care • investigate legal and ethical issues related to emergency procedures. • demonstrate correct use of PPE in relation to standard precautions for prevention or spread of disease. • compose an emergency plan for the home. • assess the physical and mental status of the client. • research and debate issues concerning organ donation. • evaluate data related to the mortality rate of the local community. • identify and locate designated emergency shelters in the community. • compare and contrast emergency procedures used in the media to reality. • inspect the school and/or home for potential safety hazards. • evaluate current health or safety issues in the community. • research current data available on the economic impact of life support systems. • evaluate emergency services and resources available in the community. • demonstrate proficiency in CPR, AED and first aide techniques.
4.2 1.16 6.1 2.38	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • demonstrate employability and social skills relevant to careers.
Connections <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • American Heart Association/National Safety Council • American Red Cross/American Safety Health Institute (ASHI) • National Health Care Skills Standards • Occupational Safety and Health Administration Standards (OSHA) • Secretary's Commission on Achieving Necessary Skills (SCANS) • Kentucky Core Content for Assessment 4.0 	

HEALTH SCIENCE INDEPENDENT STUDY

<p>Course Description: This course is a project-based learning experience developed by the student, a professional mentor and the Health Science teacher. The project development provides opportunities for an in-depth study of at least one aspect of the health care industry. The student demonstrates the ability to utilize a variety of resources, advanced technology, and communication skills in the development, implementation and presentation of a project. The course will be a combination of classroom instruction and supervised research equivalent to an average of five periods per week. The student must meet with the classroom teacher at least once each week for the purpose of project planning, reporting, evaluation, and supervision/coordination.</p>	
Academic Expectations	Content/Process
1.1 4.3; 4.4 1.12 2.13 1.12 1.11	<p>Students will</p> <ul style="list-style-type: none"> • Select, develop and implement a project plan • Practice ethical and professional discretion • Develop a comprehensive project report • Interpret data and information • Compile and present project for an audience • Maintain a journal of research activities • Complete a in-depth study of one aspect of the health care industry
4.2 1.16 6.1 2.38	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • Demonstrate employability and social skills relevant to health science major
<p style="text-align: center;">Connections</p> <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • National Health Care Skill Standards • Secretary's Commission on Achieving Necessary Skills (SCANS) • Kentucky Core Content for Assessment 4.0 	

HOLISTIC HEALTH

Course Description: Course focus is promotion of health through assessment of individuals' growth and development across the life span. Consideration is given to the family, cultural, environmental, spiritual, and genetic influences when meeting basic human needs.	
Academic Expectations	Content/Process
2.29, 2.31, 2.35	Students will <ul style="list-style-type: none"> investigate factors that influence personal behaviors that impact growth and wellness.
1.1	<ul style="list-style-type: none"> research effective interpersonal communication skills that facilitate healthy relationships
2.31	<ul style="list-style-type: none"> develop instruments to evaluate lifestyle practices including behavioral choices, nutrition, physical activity and safety
2.33	<ul style="list-style-type: none"> <ul style="list-style-type: none"> investigate emergency plans and strategies for disaster situations
2.2	<ul style="list-style-type: none"> understand the impact of communicable diseases and common diseases on a healthy lifestyle
2.2	<ul style="list-style-type: none"> investigate factors that influence mental and emotional well-being such as stress, abusive behaviors, peer pressure, etc.
1.1; 2.31; 2.32	<ul style="list-style-type: none"> research and devise a plan to maintain emotional, physical, and mental health
2.33	<ul style="list-style-type: none"> compare available community resources and services to promote a healthier lifestyle
2.30	<ul style="list-style-type: none"> <ul style="list-style-type: none"> investigate factors that influence consumer decision making such as advertising techniques and nutritional analysis.
2.2	<ul style="list-style-type: none"> <ul style="list-style-type: none"> Investigate various stages of human growth and development Compare and contrast developmental theories as they relate to health promotion.
4.2	<ul style="list-style-type: none"> utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development.
1.16	<ul style="list-style-type: none"> use information technology applications as appropriate to health care specialties.
6.1	<ul style="list-style-type: none"> integrate literacy and numeracy concepts and processes across all curricular units
2.38	<ul style="list-style-type: none"> demonstrate employability and social skills relevant to health careers.
Connections <ul style="list-style-type: none"> Kentucky Occupational Skill Standards National Health Care Skill Standards Omnibus Budget Reconciliation Act (OBRA) Guidelines Secretary's Commission on Achieving Necessary Skills (SCANS) Kentucky Core Content for Assessment 4.0 	

LEADERSHIP DYNAMICS

Course Description: This course is designed to assist students with developing skills needed to be successful leaders and responsible members of society. The student will develop personal attributes and social skills. Emphasis will be placed on interpersonal skills, team building, communication, personal development and leadership. This course will include opportunities for students to apply their knowledge.	
Academic Expectations	Content/Process
3.0; 4.0 2.14 2.14 2.14 1.11; 1.3; 1.4 2.16 2.37; 4.2 4.4; 4.5 2.14 2.17 2.29 2.31 2.2 2.17 5.3	<ul style="list-style-type: none"> • Students will: • develop personal and group goals. • compare the types of leadership styles. • assess the importance of qualified leaders to the success of organizations. • appraise personal characteristics of successful leaders. • develop verbal and non-verbal communication skills to enhance success in school and transition to the world of work. • demonstrate appropriate business/professional etiquette. • demonstrate shared decision making • develop techniques to resolve conflicts that occur in school, home, community, and workplace (interpersonal team skills). • demonstrate the use of parliamentary procedure skills in presiding over a meeting. • describe how ethical and social behaviors affect our lives. • identify self-management techniques. • identify stress management techniques • analyze organizational structures and their components (including bylaws, officers, committees, and program of work.) • demonstrate awareness of cultural diversity and equity issues. • analyze leadership opportunities available in the school and community.
4.2 1.16 6.1 2.38	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • demonstrate employability and social skills relevant to health careers.
Connections <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • National Health Care Skill Standards • Career Technical Student Organizations/Health Occupations Students of America • Secretary's Commission on Achieving Necessary Skills (SCANS) • Kentucky Core Content for Assessment 4.0 	

MEDICAID NURSE AIDE

Course Description: The Medicaid Nurse Aide program consists of classroom instruction and clinical experience. The program is a minimum of 75 hours with 16 of these hours in the clinical setting. Classroom instruction provides the students with the knowledge and skills required to care for individuals in a long-term care facility/ acute care facility. Instruction focuses on communication, infection control, safety, residents’ rights and basic nursing skills. The clinical experience allows the student to assume the role of a nurse aide and apply knowledge and skills learned in the classroom setting. Students should complete Principles of Health Science and Emergency Procedures prior to taking this course. This program meets the requirements set forth by Kentucky Medicaid program and provides the opportunity for students to become Nurse Aide State Registered.	
Academic Expectations	Content/Process
1.3; 1.4	<ul style="list-style-type: none">Develop and practice effective oral and written communicate skills
4.2	<ul style="list-style-type: none">Understand the roles and responsibilities of individual members of the health care team
2.37	<ul style="list-style-type: none">Prepare supplies, equipment and client for procedures according to facility protocol
2.17	<ul style="list-style-type: none">Use accepted ethical practices with respect to cultural, social, and ethnic differences
2.14	<ul style="list-style-type: none">Discuss legal responsibilities, limitations, and the implications of actions within the health care delivery system
2.3	<ul style="list-style-type: none">Examine how key system relate to the services performed and affect the quality of client care
2.31	<ul style="list-style-type: none">Prevent injury or illness through safe work practices by following health and safety policies and procedures
2.37	<ul style="list-style-type: none">Demonstrate professional etiquette and responsibility
2.14;2.15	<ul style="list-style-type: none">Demonstrate knowledge of applicable laws, statues or regulations in the pre-nursing career major area
2.37	<ul style="list-style-type: none">Demonstrate performance skills outlined on the Kentucky Medicaid Nurse Aide Task List
1.12; 6.2	<ul style="list-style-type: none">Assess client health status according to respective professional standards and report results to treatment team
2.20	<ul style="list-style-type: none">Analyze the organizational structure of the pre-nursing career major area
2.37	<ul style="list-style-type: none">Demonstrate the effective use of time management skills
2.36	<ul style="list-style-type: none">Develop a plan to maintain and upgrade skills i.e. Advanced Nurse Aide Certification
4.2	<ul style="list-style-type: none">utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development.
1.16	<ul style="list-style-type: none">use information technology applications as appropriate to health care specialties.integrate literacy and numeracy concepts and processes across all curricular unitsDemonstrate employability and social skills relevant to pre-nursing career major
6.1	
2.38	
Connections	
<ul style="list-style-type: none">Kentucky Core Content for Assessment 4.0Medicaid Services Manual—Kentucky Medicaid ProgramNational Health Care Skill Standards	

MEDICAL MATH

Course Description: This course is designed to focus, utilize and build on mathematical skills commonly used in all health occupations. Students will use applied techniques, problem-solving and critical thinking to perform mathematical operations such as computations, ratio and proportion, weights and measurements and conversions. This course is strongly recommended for all Health Science majors. Completion of Algebra I is suggested prior to enrolling in this course. This course may meet the requirements for the fourth elective mathematics credit required for graduation.

Academic Expectations	Content/Process
<div>1.9</div> <div>2.7</div> <div>2.8</div> <div>2.8</div> <div>6.1</div> <div>2.10</div> <div>2.10</div> <div>1.10</div> <div>1.5</div> <div>2.8</div> <div>2.7</div> <div>2.7</div> <div>2.10</div> <div>2.7</div> <div>1.9</div> <div>2.13</div> <div>2.8</div> <div>2.10</div>	<p>Students will</p> <ul style="list-style-type: none"> perform fundamental arithmetic operations on whole numbers, fractions, decimals and percents for accuracy and speed. understand mathematical procedures and use them appropriately. accurately calculate oral and parenteral dosages. relate mathematics to activities in the health science and discuss the importance of a thorough understanding of mathematics to a successful career in the health professions. analyze and compare over-the-counter medications as to the number of doses and unit price. observe and record the ways measurement is used in a medical laboratory. use various types of graphs to interpret and analyze information. organize information using classification rules and systems (e.g. symbols, abbreviations, Roman numerals). estimate values for operations involving decimals and cognitively compute the results. represent fractions as ratios in simplest form. evaluate numbers having positive and negative exponents. represent numbers in scientific notation. demonstrate knowledge of measurement systems and conversion principles. perform addition, subtraction, multiplication, and division of signed numbers. relate words to algebraic expressions. set up and solve proportions. find the mean, median, and mode for a group of values. use the 24-hour clock (military time).
<div>4.2</div> <div>1.16</div> <div>6.1</div> <div>2.38</div>	<ul style="list-style-type: none"> utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. use information technology applications as appropriate to health care specialties. integrate literacy and numeracy concepts and processes across all curricular units demonstrate the employability and social skills relevant to health careers.
<p>Connections</p> <ul style="list-style-type: none"> Kentucky Occupational Skill Standards National Health Care Skill Standards Secretary's Commission on Achieving Necessary Skills (SCANS) Kentucky Core Content for Assessment 4.0 	

MEDICAL TERMINOLOGY

Course Description:

A course designed to develop a working knowledge of language in all health science major areas. Students acquire word-building skills by learning prefixes, suffixes, roots and abbreviations. Students will learn correct pronunciation, spelling and application rules. By relating terms to body systems, students identify proper use of words in a medical environment. Knowledge of medical terminology enhances the student's ability to successfully secure employment or pursue advanced education in health care.

Academic Expectations	Content/Process
<div>1.10</div> <div>2.37</div> <div>2.27</div> <div>1.2</div> <div>1.2</div> <div>1.1</div> <div>1.2</div> <div>6.1</div> <div>1.12</div> <div>1.10</div> <div>2.38</div>	<p>Students will</p> <ul style="list-style-type: none"> • arrange word roots, prefixes, and suffixes to form medical terms. • categorize word parts by body systems. • interpret terms relating to all major body systems. • correlate origin of terms to other languages. • identify medical acronyms, homonyms and eponyms. • recognize and define plural forms of medical terms. • access resources to enhance understanding of medical terms. • identify and use common medical abbreviations. • relate medical terms to normal anatomy, growth and development, diagnostic procedures, pharmacology, surgery, mental health and medical specialties. • compare the use of medical terms in the media and real-life situations. • pronounce medical term • demonstrate employability and social skills relevant to health careers. • use medical terminology within a scope of practice in order to interpret, transcribe and communicate information, data and observations. • recognize and define suffixes that denote noun, adjective, singular, and plural forms of medical words. • categorize major prefixes in the following groups: position, number, measurement, negation, direction, and other prefixes • demonstrate the employability and social skills relevant to health careers.
<div>4.2</div> <div>1.16</div> <div>6.1</div>	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units
<p style="text-align: center;">Connections</p> <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • Secretary's Commission on Achieving Necessary Skills (SCANS) • National Health Care Skills Standards • Kentucky Core Content for Assessment 4.0 	

PRINCIPLES OF HEALTH SCIENCE

Course Description: Principles of Health Science is an orientation and foundation for occupations and functions in any health care profession. The course includes broad health care core standards that specify the knowledge and skills needed by the vast majority of health care workers. The course focuses on exploring health career options, history of health care, ethical and legal responsibilities, leadership development, safety concepts, health care systems and processes, and basic health care industry skills. This introductory course may be a pre-requisite for additional courses in the Health Science program.	
Academic Expectations	Content/Process
2.20	Students will <ul style="list-style-type: none">analyze and interpret medical milestones, conditions, trends and issues to develop historical perspectives about the health care industryexplore the organizational structure of various health care facilitiesobserve, analyze and interpret human behaviors, social groupings and institutions to better understand people and the relationship among individuals and among groups.identify how key systems affect services performed and the quality of health care.describe ethical practices with respect to cultural, social and ethnic differences within the health care environment.recognize legal responsibilities, limitations and the implications of actions within the health care industry and manage professional behavior accordingly.evaluate services, products, and resources available in the community and state in order to make effective consumer decisions.follow health and safety policies and procedures to prevent injury or illness through safe work practices.understand the roles and responsibilities of the health care team and interact effectively with all team members.explore Maslows' Hierarchy of Needs.recognize an acceptable Code of Conduct for a health care worker.use strategies for choosing and preparing for a career in the health care industry.apply methods of giving and obtaining information to communicate effectively, both orally and in writing.demonstrate skills and work habits that lead to success in future schooling and work.
2.16	
2.17	
2.14	
2.18, 2.33	
2.31	
2.16	
2.16	
3.5	
2.36	
1.12	
2.37	
4.2	<ul style="list-style-type: none">utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development.use information technology applications as appropriate to health care specialties.integrate literacy and numeracy concepts and processes across all curricular unitsdemonstrate key employability skills (e.g. interviewing, writing resumes, completing applications) needed for further education or employment.
1.16	
6.1	
2.38	
Connections <ul style="list-style-type: none">Kentucky Occupational Skill StandardsSecretary's Commission on Achieving Necessary Standards (SCANS)Kentucky Tech CurriculumNational Health Care Core StandardsKentucky Core Content for Assessment 4.0	

CURRENT CURRICULUM PROJECTS UNDER DEVELOPMENT



MEDICAL MICROBIOLOGY (Under development)

Course Description: Students conduct laboratory investigations and fieldwork, use scientific methods during investigations, and make informed decisions using critical thinking and problem solving skills. Students will study the relationships of microorganisms to wellness and disease. They develop knowledge and skills related to disease prevention by learning the chain of infection, asepsis and standard precautions. Pathogenic and nonpathogenic organisms will be identified to assist in the understanding of specific diseases, causative agents, and treatment options. The course must include at least 40% laboratory investigation and fieldwork using appropriate scientific inquiry.

Academic Expectations	Content/Process
	<ul style="list-style-type: none"> • Introduction to Microbiology • Laboratory safety • Infection control • History of Medical Microbiology • The immune response • Microorganisms • Basic concepts of Medical Microbiology • Laboratory investigations and identification of causative agents
4.2 1.16 6.1 2.38	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • Demonstrate employability and social skills relevant to pre-nursing career major
<p style="text-align: center;">Connections</p> <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • National Health Care Skill Standards • Secretary's Commission on Achieving Necessary Skills (SCANS) • Kentucky Core Content for Assessment 4.0 	

PHARMACOLOGY (Under development)

Course Description: This course will provide an overview of the pharmacokinetics and pharmacodynamics of prescription and nonprescription medications and products. Course content will emphasize drug classifications, drug action and interactions, drug administration, ethical and legal issues and safety. Students will develop an understanding of pharmaceuticals and its impact on the health care industry. Career options in pharmacy will be explored.	
Academic Expectations	Content/Process
	<ul style="list-style-type: none">• Basic Concepts in Pharmacology• Career Opportunities in Pharmaceutics• Ethical and Legal responsibilities and issues• Safety in a Pharmacy• Drug names, classifications, actions and interactions• Drug administration• Drug measurement, dosage considerations and conversions• Vitamins, minerals and nutritional supplements• Common poisons—mode of action, symptoms, and treatments• Technologies in pharmacology• Marketing of pharmaceuticals
4.2	<ul style="list-style-type: none">• utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development.• use information technology applications as appropriate to health care specialties.• integrate literacy and numeracy concepts and processes across all curricular units• Demonstrate employability and social skills relevant to pre-nursing career major
1.16	
6.1	
2.38	
Connections <ul style="list-style-type: none">• Kentucky Occupational Skill Standards• National Health Care Skill Standards• Secretary’s Commission on Achieving Necessary Skills (SCANS)• Kentucky Core Content for Assessment 4.0	

PRINCIPLES OF TEACHING (Pilot 2006-07)

Course Description: This course will provide opportunities for students with an interest in teaching to develop skills, strategies, and techniques used for instruction at various grade levels. Students will gain work experience in classrooms with certified teachers as part of their course work. Other components may include development of a four-year postsecondary plan, salary information, benefits of being a teacher, expectations of Kentucky teachers, job security and projection of the job market opportunities.	
Academic Expectations	Content/Process
	Students will <ul style="list-style-type: none"> •
4.2 1.16 6.1 2.38	<ul style="list-style-type: none"> • utilize activities of Health Occupations Students of America (HOSA) as an integral component of course content, skills application, and leadership development. • use information technology applications as appropriate to health care specialties. • integrate literacy and numeracy concepts and processes across all curricular units • Demonstrate employability and social skills relevant to pre-nursing career major
Connections <ul style="list-style-type: none"> • Kentucky Occupational Skill Standards • National Health Care Skill Standards • Secretary's Commission on Achieving Necessary Skills (SCANS) • Kentucky Core Content for Assessment 4.0 	



Please note: Cooperative Education is NOT an approved stand-alone Health Science course. This work-based learning experience can be a part of any Health Science class. See Cooperative Education Regulations 705-KAR 4:041.

COOPERATIVE EDUCATION I, II—ALLIED HEALTH

Course Description: Students who have completed prerequisites in the Allied Health Career Major may participate in paid work experience. The student must be enrolled in a related preparatory subject within the school year. Work experience should be aligned with the Individual Learning Plan in the area of Health Science and meet all Cooperative Program Standards per 705-KAR 4:041. The Health Science Technology teacher shall arrange and coordinate with the health care employer for work requirements, task expectations and evaluation. A training agreement describing approved skills to be performed and evidence of an evaluation process shall be filed with the Health Science Education program.

COOPERATIVE EDUCATION I, II—PRE-NURSING

Course Description: Students who have completed prerequisites in the Pre-Nursing Career Major may participate in paid work experience. The student must be enrolled in a related preparatory subject within the school year. Work experience should be aligned with the Individual Learning Plan in the area of Health Science and meet all Cooperative Program Standards per 705-KAR 4:041. The Health Science Education teacher shall arrange and coordinate with the health care employer for work requirements, task expectations and evaluation. A training agreement describing approved skills to be performed and evidence of an evaluation process shall be filed with the Health Science Education program.